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(56) Documents Cited

GB 0446726 A  
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(54) Abstract Title

Exercise baton

(57) A exercise device comprises a baton 1 having a proximal end 2 which is intended in use to be grasped by the user, and a distal end 3 provided with a weight 4, being either adjustable in mass or position-adjustable towards or away from the proximal end 3 in order to vary the effective weight of the device when said device is swung by the user. The device may be provided with a housing 9 to enclose said weight 4. The housing may be in communication with the weight such that when the housing is rotated about the longitudinal axis, the weight is moved towards or away from said proximal end 3. The weight 4 may comprise a hollow body which may be filled with sand, water or other substance to vary the mass of the hollow body. An accelerometer may be associated with said weight to give an indication of the users exercise performance.

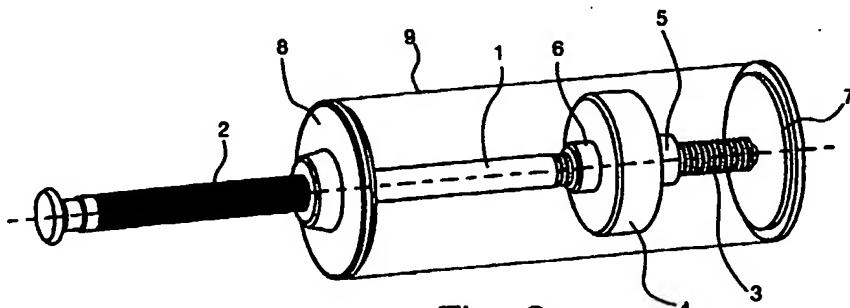


Fig. 3

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

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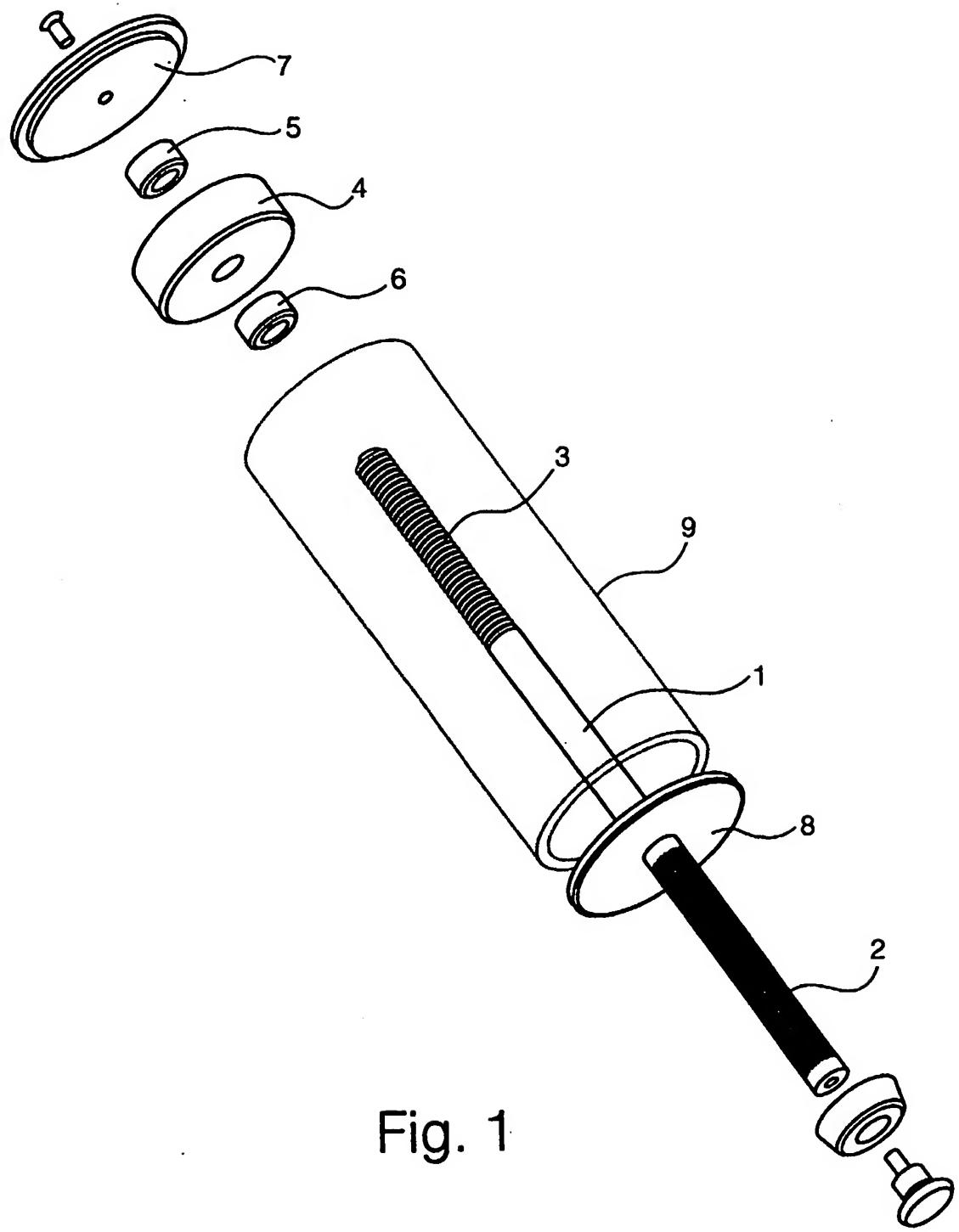


Fig. 1

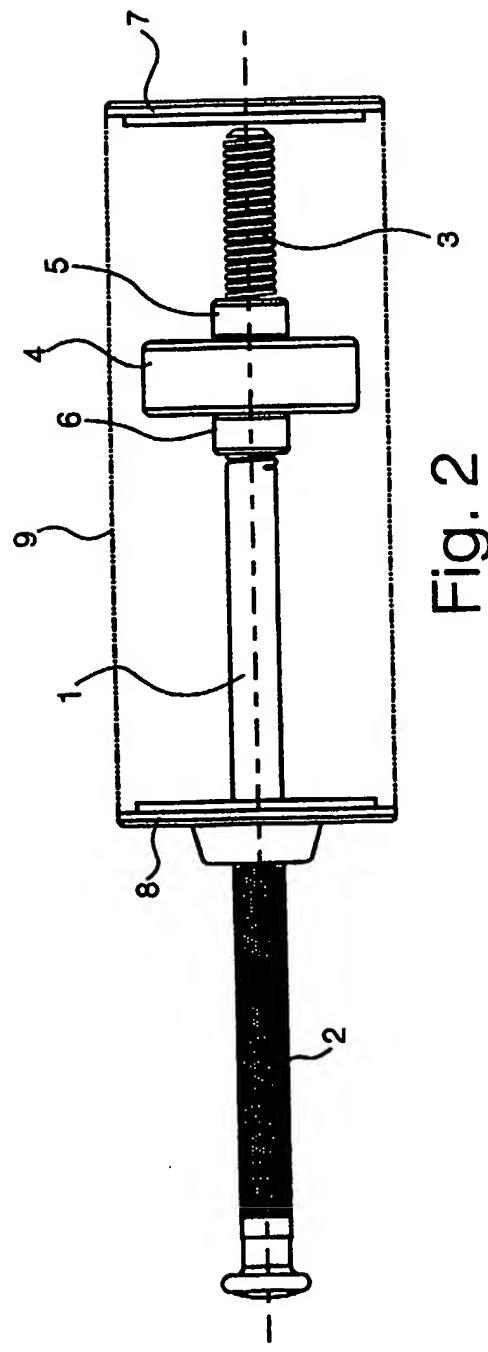


Fig. 2

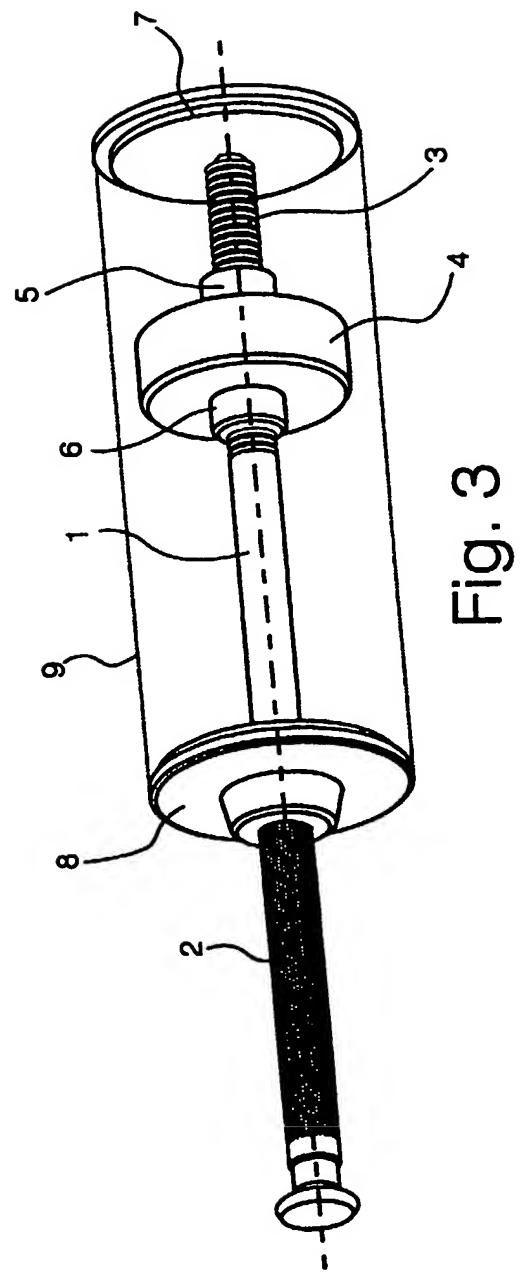


Fig. 3

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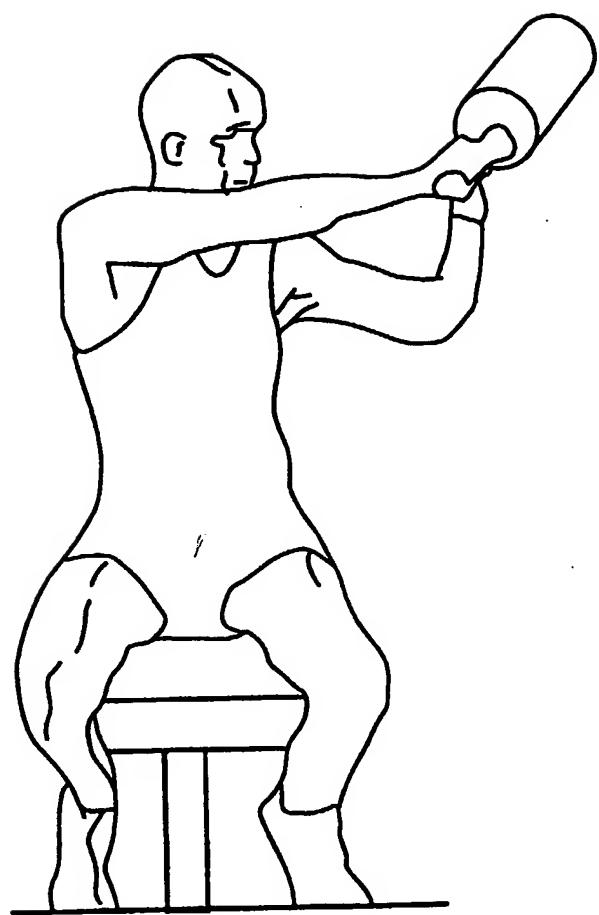


Fig. 4

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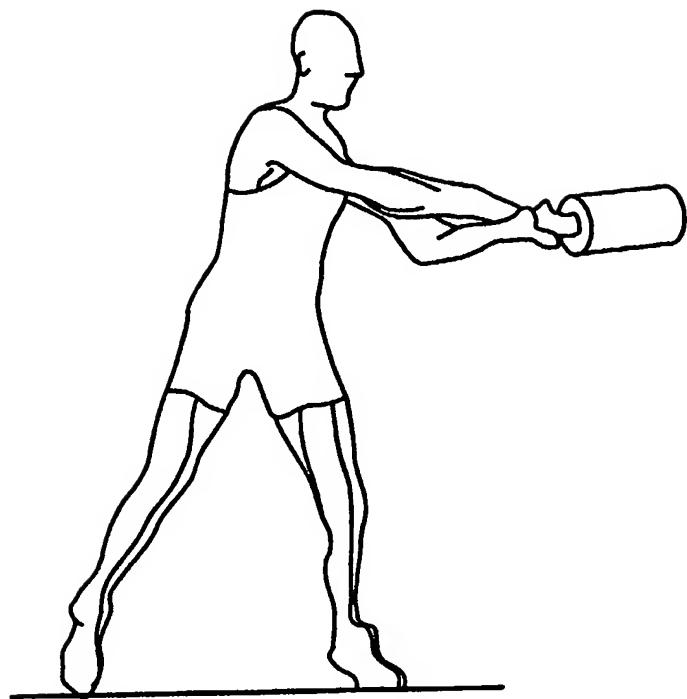


Fig. 5

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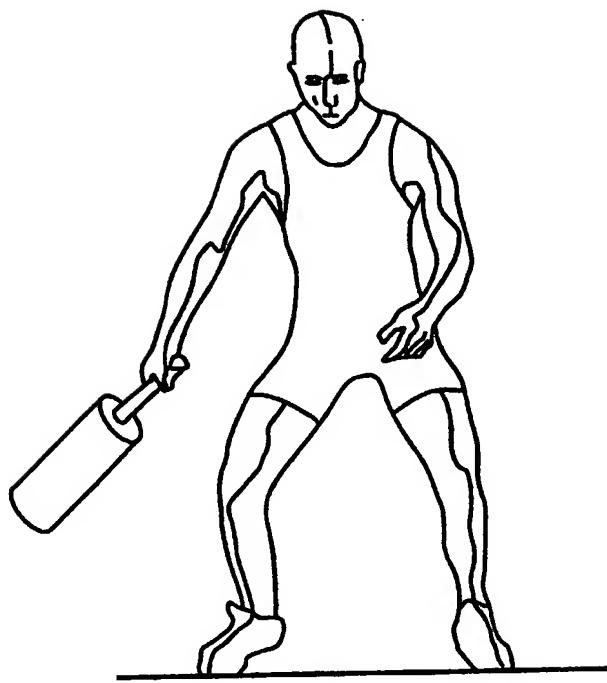


Fig. 6

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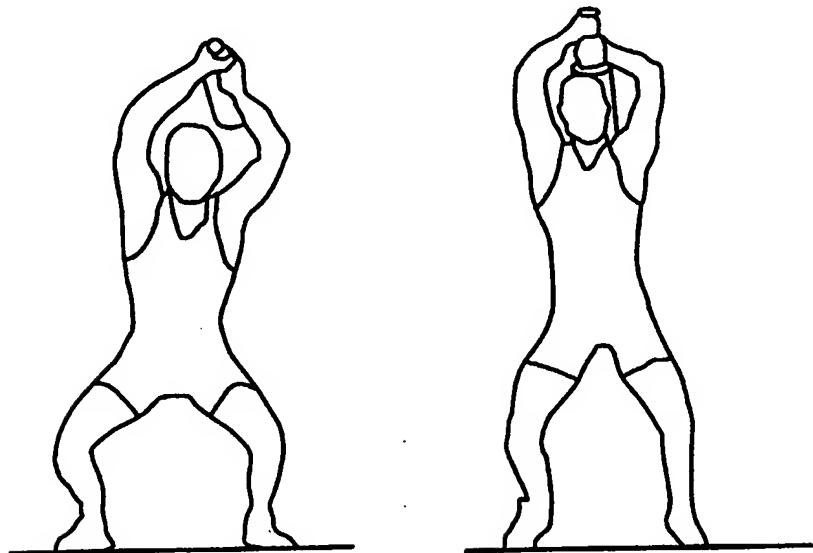
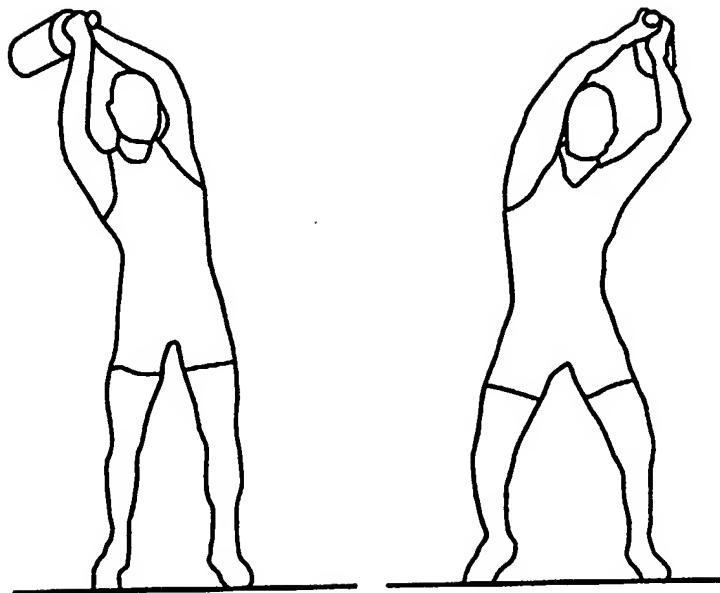


Fig. 7

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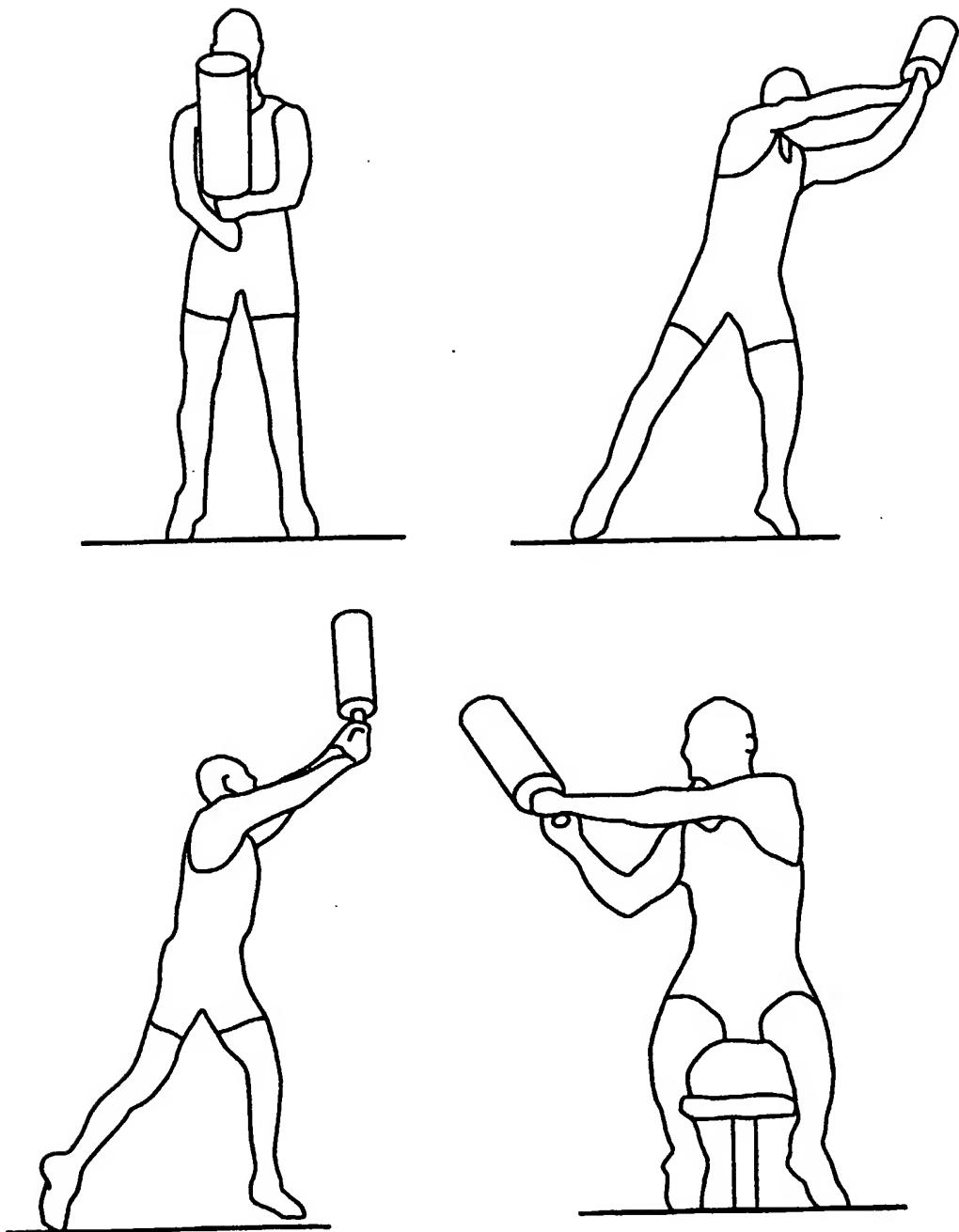


Fig. 8

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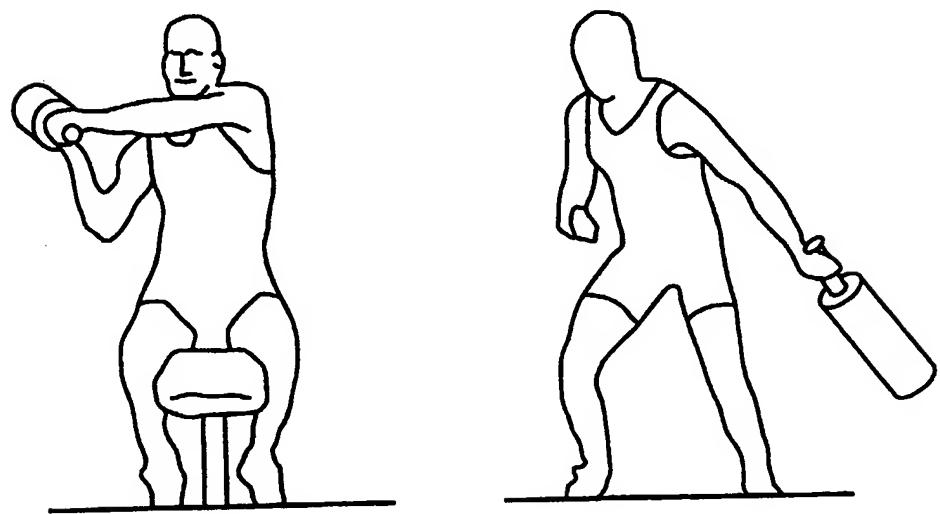
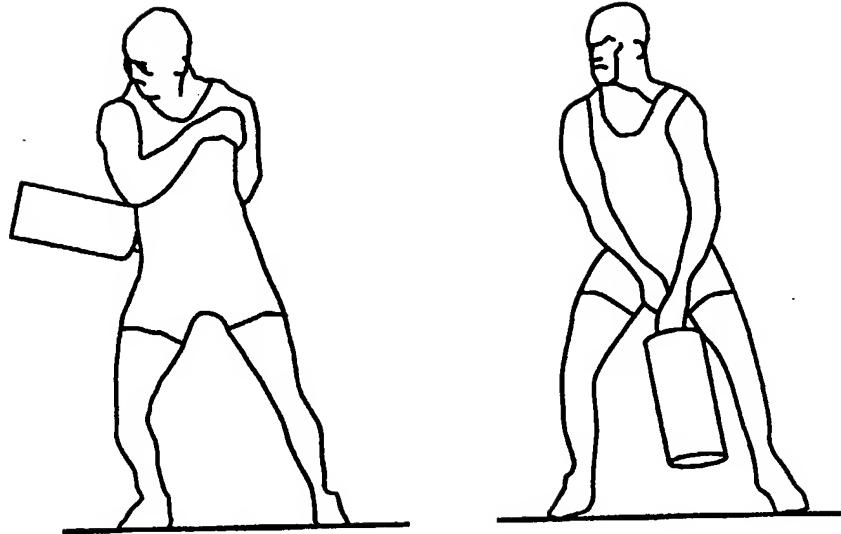


Fig. 9

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**EXERCISE DEVICE**

This invention relates to the field of devices for exercising the human body.

5

With increased public awareness of the benefits of exercise, there is a significant market for devices which can aid or facilitate the exercising of specific muscle groups. Devices such as dumb-bells, wrist weights or the like can be used either by an individual exercising alone or by a group or class exercising under instruction.

15 There is however a problem in that such devices are of a standard size or weight which may not demand the optimum level of effort from the individual concerned. On the other hand, the cost would be prohibitive of providing a very large range of devices of different sizes and weights which would cater for all users. There is thus a need for an exercise device which is appropriate for use 20 by a wide range of individuals of different fitness levels.

**SUMMARY OF THE INVENTION**

25 According to the present invention there is provided an exercise device comprising a baton having a proximal end which is intended in use to be grasped by a user, and a distal end provided with a weight, the weight being position-adjustable toward or away from the proximal end 30 and/or being adjustable in mass in order to vary the effective torque of the device when said device is swung by a user.

35 Preferably, the proximal end includes a knurled or other grip-improving surface to facilitate being held in a

user's grasp.

Preferably, said baton has a screw-thread at said distal end and said weight is threadedly mounted thereon. The

- 5 weight can simply be rotated about the longitudinal axis of the baton to screw it towards or away from the proximal end. Therefore the effective torque of the device, when being swung by a user, can be easily set appropriately for the particular user concerned.

10

Preferably, the device further comprises a housing which encloses said weight. This also improves the aesthetic appearance of the device.

- 15 In a preferred form, the housing is in communication with said weight such that when said housing is rotated about the longitudinal axis of the baton, the weight is moved toward or away from said proximal end. In this way, the housing does not need to be removed from the baton in  
20 order to adjust the weight, making the device even more straightforward to use.

In a further preferred form, the weight is removable and replaceable with a weight having a different mass. This  
25 alone will vary the effective torque of the device but, instead or in addition, the torque could be varied by adjusting the position of the weight with respect to the proximal end of the baton.

- 30 Preferably, the weight is provided with locking means to fix the weight in the desired position on the baton. Ideally, the locking means comprises a pin or bolt which is engageable in one of a series of longitudinally-spaced apertures on the baton. Alternatively, the locking means  
35 comprises a threaded collar mounted on the baton which,

in use, abuts the distal side of the weight preventing it from moving further towards the distal end of the baton.

- In a further preferred form, said baton is telescopic.  
5 This provides means by which the length of the baton may be readily adjusted.

Preferably, said baton comprises two or more interlocking sections. This provides another means by which the  
10 length of the baton may be readily adjusted.

In a preferred form at least two of said interlocking sections have different mass to one another so that, in use, said interlocking sections comprise said weight. In  
15 this way, the centre of gravity of the baton can be altered by selecting the order in which the interlocking sections are assembled together.

In a preferred embodiment, the weight comprises a hollow body which is fillable with sand, water or other material to increase the mass of the hollow body.  
20

Preferably, said weight comprises a compartmentalised cylinder, each compartment of which is fillable with sand, water or other material to increase the mass of the cylinder.  
25 Ideally, said compartmentalised cylinder is said housing.

Preferably, the device further comprises an accelerometer associated with said weight. Advantageously, data from  
30 said accelerometer is processed by a microprocessor and displayed on a display. Ideally, a keypad may be used to input exercise parameters. Preferably, the device further comprises a communication port, antenna, optical or ultrasonic link for downloading or transmitting  
35

exercise data to a computer for further analysis.

**BRIEF DESCRIPTION OF THE DRAWINGS**

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Preferred embodiments of the invention will now be more particularly described, by way of example only, with reference to the accompanying drawings, in which:

- 10 Figure 1 is an exploded perspective view of an exercise device embodying the invention;  
Figure 2 is a schematic side view, showing the interior of the housing; and  
Figure 3 is a schematic perspective view, showing the  
15 interior of the housing.  
Figures 4-9 are schematic representations of typical exercises which can be carried out using the device of the present invention.

20

**DESCRIPTION OF THE PREFERRED EMBODIMENTS**

Throughout this specification, reference to a "baton" means any generally elongate hand-held article suitable  
25 for use in the exercise device of the present invention.

The exercise device of the present invention is intended specifically for exercising the human body and comprises a rigid solid or hollow baton with a weight or weights attached to it. The proximal end of the baton is intended to be held in either one or two hands and is provided with a knurled surface, rubber grip or other grip-improving means. The distal end of the baton carries a weight of selected mass which is generally position-adjustable along the baton. Exercise is

accomplished by swinging the baton through a series of recommended trajectories designed to exercise, tone and strengthen various parts of the body. The device can be used in a standing, sitting or other position by the user  
5 to ensure exercise of appropriate muscle groups and is particularly suitable for disabled users.

An exploded view of one embodiment of the device is shown in Figure 1. A baton 1 is provided with a handgrip 2 at  
10 its proximal end and a screw-thread 3 at its distal end. A position-adjustable weight 4, having a central aperture therethrough can be slid onto the end of the baton and retained in a desired position by two threaded collars 5,  
15 6. In an alternative embodiment (not illustrated) the threaded collars are optional if the central aperture through the weight is itself screw-threaded.

In a further alternative embodiment (not illustrated) a different locking means is employed in which the or each  
20 weight is provided with a locating pin, bolt or the like which engages in one of a series of longitudinally-spaced apertures or recesses provided along the baton. Other methods of locking the or each weight may be envisaged, for example using one or more clamps, clips, collets or  
25 wedges.

Preferably, to improve the cosmetic appearance of the exercise device, two end plates 7, 8 and a cylindrical housing 9 enclose the weight 4.

30 Before use, the weight 4 can be moved along the baton 1 to provide the desired torque for exercise purposes. One or more weights of varying mass may be mounted on the baton depending upon the user's preference. Weights  
35 having different masses may be made available so that the

user can select the most appropriate, in which case the weight 4 needs to be readily removable from and replaceable on the baton 1.

- 5 The length of the baton may be adjustable by incorporating a telescopic mechanism or by the use of interlocking sections which may be added or removed to obtain the desired length of baton.
- 10 A further advantage of using interlocking sections is that if at least one of the interlocking sections differs in mass from the others, it can be selectively positioned so as to alter the centre of gravity of the baton and thus the effective torque of the device in use. For example, one or more of the interlocking sections could be made from a different material (for example lead-filled) or could be solid wherein the other interlocking sections are hollow. In this embodiment, the baton itself serves the same purpose as the weight 4 described above.
- 20

A readily-portable embodiment of the invention is envisaged wherein the weight or weights comprise hollow toroids which can be slid along the baton and located within the housing in the same way as described above. The toroids are provided with a small sealable orifice such that they may be filled with a material such as sand, water or the like to increase their mass to the desired level. The advantage of this embodiment is to facilitate storage and transport since when not in use, the toroids may be emptied thus significantly reducing the dead weight of the device. The design of the toroids may inherently provide an acceptable cosmetic appearance in which case the outer housing could be omitted. An alternative version of this embodiment comprises a fixed

compartmentalised cylinder instead of the toroids. Each compartment is provided with a sealable orifice such that it may be filled with sand, water or the like as with the hollow toroid design described above. The 5 compartmentalised cylinder may take the place of the cylindrical housing 9.

In a further embodiment, the cylindrical housing 9 may be in communication with the weight enclosed therein such 10 that, upon rotating the housing about the longitudinal axis of the baton, the weight (and hence the housing attached thereto) moves toward or away from the proximal end of the baton, along the screw-thread. This avoids the need to remove the housing before the position of the 15 weight can be adjusted and then replace it before the device can be used. In this embodiment, it may be necessary to omit one or both of the end plates 7, 8.

In a preferred embodiment, an indication of exercise 20 performance can be provided using a small accelerometer (not illustrated) attached to any particular weight. Data from this can be processed by a small enclosed microcomputer which can determine the acceleration, velocity and trajectory of the weight and hence the work 25 done. An integral LCD display and keypad can be used for displaying data such as work done and elapsed time and for inputting weight data, and other exercise parameters respectively. A further embodiment of the device comprises a load cell and accelerometer embedded within 30 the baton to provide more accurate determination of work done and to obviate the need for entering weight values and for locating the accelerometer. In addition to, or instead of, an accelerometer, a gyroscopic device could be used to determine trajectories and/or work done. 35 Trajectory and/or work done could also be determined

- utilising wireless, ultrasonic or optical techniques (for example a camera used to track the exercise device). A further option is a computer link from the onboard microcomputer in which exercise data can be either  
5 communicated to a computer through a wired or wireless link or downloaded after the exercise session via a communication port to enable full recording and analysis of work done.
- 10 The exercise device of the present invention is a functional training device which can be used to develop all the major muscle groups of the body. The device has applications in three main areas:
- 15 a) General Fitness and Health  
b) Sports Conditioning  
c) Rehabilitation
- a) General Fitness and Health**
- 20 According to the weight used, movements deployed and design of the training programme, the device may be used to target specific muscle groups with a view to developing general or specific muscle strength, endurance  
25 or power. Additionally, the device may be used to develop cardiovascular fitness in accordance with the guidelines for developing health and fitness in healthy adults as identified by the American College of Sports Medicine in their 1998 Position Stand. The device has  
30 been designed to be used in a one-on-one individualised setting or in instructor-led, group activity, with or without music. It is particularly suited to aerobics classes and similar group training activities since, due to its unique weight and torque adjustment features, each  
35 unit may be set to suit a wide range of abilities,

strengths and states of fitness. Also, the class easily follows trajectories demonstrated by the instructor. It may also be used by those confined to a sitting position, including the frail elderly and many individuals who are 5 wheelchair bound.

**b) Sports Conditioning**

The device is particularly well suited to the development of both general and sports specific muscular endurance, 10 strength and power in virtually all sports. In the classic "overhead" sports (including all racket sports, throwing events, and swimming, but not excluding sports with an overhead component such as volleyball, basketball, netball and handball) the device can be used 15 to condition the muscles of the arm, shoulder girdle (including the muscles of the scapular platform) and the trunk. In addition, using specific movements and training drills, the device can be used to develop the postural muscles and develop core stability, balance and 20 control. Core stability training is crucial to the martial arts, multi-sprint sports (such as soccer, hockey, rugby union, rugby league, American football) and all athletic events and activities. By following recommended specific swing trajectories, movement 25 patterns and carefully prescribed training recommendations and programmes, selected muscle groups may be targeted and developed. Additionally, the device can be used to help develop generally or specifically the energy systems utilised in a wide variety of different 30 sports. Consequently, the device has sports specific applications in all sports and movement activities. The device may be used in the standing or sitting position and is therefore additionally suitable for many 35 wheelchair athletes in numerous sports. The optional indicators of work done allow for accurate quantification

of work done and useful biofeedback, crucial to effective training programme monitoring and progression.

c) Rehabilitation

5

The device may be used in both early and late stage rehabilitation and is particularly well suited to the rehabilitation of the upper extremity and trunk. In addition, it may be used for closed kinetic chain 10 exercises for the trunk and lower extremity and for both movement and sports specific functional activity. The optional indicators of work done allow for accurate quantification of the work performed, rehabilitation programme progression and biofeedback. In addition, the 15 device may also be used by sports rehabilitation specialists, physiotherapists and suitably trained coaches for the correction of muscle imbalances which might predispose an individual to injury.

## CLAIMS

1. Exercise device comprising a baton having a proximal end which is intended in use to be grasped by a user, and a distal end provided with a weight, the weight being position-adjustable toward or away from the proximal end and/or being adjustable in mass in order to vary the effective torque of the device when said device is swung by a user.
- 5
10. Exercise device as claimed in claim 1 wherein said proximal end includes a knurled or other grip-improving surface.
15. 3. Exercise device as claimed in claim 1 or claim 2 wherein said baton has a screw-thread at said distal end and said weight is threadedly mounted thereon.
4. Exercise device as claimed in any of the preceding claims further comprising a housing which encloses said weight.
- 20
25. 5. Exercise device as claimed in claim 4 wherein said housing is in communication with said weight such that when said housing is rotated about the longitudinal axis of the baton, the weight is moved toward or away from said proximal end.
30. 6. Exercise device as claimed in any of the preceding claims wherein said weight is removable and replaceable with a weight having a different mass.
35. 7. Exercise device as claimed in any of the preceding claims wherein the weight is provided with locking means to fix the weight in the desired position on

the baton.

8. Exercise device as claimed in claim 7 wherein the locking means comprises a pin or bolt which is engageable in one of a series of longitudinally-spaced apertures on the baton.  
5
9. Exercise device as claimed in claim 7 wherein the locking means comprises a threaded collar mounted on the baton which, in use, abuts the distal side of the weight preventing it from moving further towards the distal end of the baton.  
10
10. Exercise device as claimed in any of the preceding claims wherein said baton is telescopic.  
15
11. Exercise device as claimed in any of the preceding claims wherein said baton comprises two or more interlocking sections.  
20
12. Exercise device as claimed in claim 11 wherein at least two of said interlocking sections have different mass to one another so that, in use, said interlocking sections comprise said weight.  
25
13. Exercise device as claimed in any of the preceding claims wherein the weight comprises a hollow body which is fillable with sand, water or other material to increase the mass of the hollow body.  
30
14. Exercise device as claimed in any of the preceding claims wherein said weight comprises a compartmentalised cylinder, each compartment of which is fillable with sand, water or other material to increase the mass of the cylinder.  
35

15. Exercise device as claimed in claim 14 when dependent on claim 4 wherein said compartmentalised cylinder is said housing.

5

16. Exercise device as claimed in any of the preceding claims further comprising an accelerometer associated with said weight.

10 17. Exercise device as claimed in claim 16 wherein data from said accelerometer is processed by a microprocessor and displayed on a display.

15 18. Exercise device as claimed in claim 16 or claim 17 wherein a keypad may be used to input exercise parameters.

20 19. Exercise device as claimed in any of claims 16 to 18 further comprising a communication port, antenna, optical or ultrasonic link for downloading or transmitting exercise data to a computer for further analysis.

25 20. Exercise device substantially as described herein with reference to the accompanying drawings.



INVESTOR IN PEOPLE

Application No: GB 0106540.8  
Claims searched: 1-20

Examiner: Paul Makin  
Date of search: 26 July 2001

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.S): A6M (MAM)

Int CI (Ed.7): A63B 15/00

Other: Online : WPI, EPODOC, JAPIO

**Documents considered to be relevant:**

Category	Identity of document and relevant passage		Relevant to claims
X	GB 446726	(BATESON) see particularly Figure 4	1,3,4,6,7, 9,11,12
X	GB 257959	(FICK) see particularly Figures 5-7	1,4,6,7, 13,14,15
X	US 5281192	(NELSON) whole document	1,2,3,6
X	US 5100148	(SMITH) whole document	1,2,6,11, 12
X	US 4819935	(DIRKSING) see particularly Figure 6	1,3,4,5,6, 10,11

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